## Space Weather Forecast

Issued on Wednesday, 24 May 2023 at 01:11 Local

**This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales**

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**Space Weather Forecast Headline: Chance of R1/R2 radio blackouts. Slight chance of G1/Minor Storm intervals.**

**Analysis of Space Weather Activity over past 24 hours**
**Solar Activity:** Solar activity has been Moderate with one Moderate-Class flare, peaking at 23/1213UTC from a region approaching north centre disc. This is the largest and most complex region on the disc, with magnetic complexity visible within the intermediate spot area. A further region near south centre disc is the next largest on the disc and is dominated by a large leading spot. The remaining three regions appear to be smaller and simpler at the present time.
No new Earth-directed Coronal Mass Ejections (CMEs) have been observed in available imagery in the last 24 hours.

**Solar Wind / Geomagnetic Activity:** Solar winds are showing coronal hole fast wind conditions. Wind speeds have been mostly elevated at 500-630 km/s. The total Interplanetary Magnetic Field started at moderate levels, but became weak through the period. The north-south component was weakly variable, but predominately southward directed. Geomagnetic activity was Quiet to Unsettled (Kp 1-3).

**Energetic Particles / Solar Radiation:** The count rate of energetic particles (high energy protons) was at background levels with no solar radiation storms occurring.

**Four-Day Space Weather Forecast Summary**
**Solar Activity:** Solar activity is expected to be Low to Moderate, with a chance of further Moderate-class flares. The main risk of flaring is from the large region near north centre disc.

**Solar Wind / Geomagnetic Activity:** There are no Earth-directed CMEs expected, although a weak CME may give some glancing influence later on 26 May or early on 27 May, however it is considered more likely this CME will miss. Solar winds are currently at elevated levels, likely due to a coronal hole fast wind. This is a persistent feature from last rotation, and a further increase in wind speed, perhaps up to 650-700 km/s is possible given the wind strength last rotation. Wind speeds are expected to gradually ease through Days 3 and 4 (26-27 May).
Geomagnetic activity will be mainly Unsettled to Active at first due to fast wind influence, with a slight chance of G1/Minor Storm intervals. Activity easing from the fast wind through the period, but there is a low possibility of an increase late Day 3 into Day 4 should any glancing CME influence occur.

**Energetic Particles / Solar Radiation:** The count rate of energetic particles (high energy protons) is forecast to be at background levels with no solar radiation storms occurring. There is just a slight chance of count rates increasing towards the minor storm threshold, should any larger flares occur.

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Met Office

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**Geomagnetic Storms:**

| Geo-Magnetic Storm Probability (Exceedance) | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Minor or Moderate | G1 to G2 | No | 20 | 10 | 5 | 5 |
| Strong | G3 | No | 1 | 1 | 1 | 1 |
| Severe | G4 | No | 1 | 1 | 1 | 1 |
| Extreme | G5 | No | 1 | 1 | 1 | 1 |

**Radio Blackouts - X Ray Flares:**

| X Ray Flares Probability | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | R1-R2 M Class | Yes | 40 | 40 | 40 | 40 |
| Very Active | R3 to R5 X | No | 5 | 5 | 5 | 5 |

**Solar Radiation Storms - (High Energy Protons):**

| Radiation Storms Probability (Exceedance) | Level ($cm^{-2}$ $sr^{-1}$ $s^{-1}$) | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | ≥ S1 | No | 5 | 5 | 5 | 5 |
| Very Active | ≥ S3 * | No | 1 | 1 | 1 | 1 |

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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